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ABSTRACT

Literature on the subject of the relationship between class size and student achievement is briefly reviewed. It is pointed out that while researchers often come to the conclusion that class size has small impact on student achievement, teachers feel that a class of under 20 students permits better and wider learning. The financing of smaller classes is discussed, and suggestions are made for possible solutions to this problem. (JD)

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THE EFFECT OF CLASS SIZE ON ACADEMIC ACHIEVEMENT

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Introduction

Today it seems that many educators are concerning themselves with the idea that class size may be important to reading achievement. Class size has always been an important issue and at times an emotional issue for educators. In the November 1978 issue of Phi Delta Kappan, NEA President John Ryor said that wages and class size were primary strike issues this year.(6:1)

An atmosphere of distrust has always hung over this controversy. Most researchers believe that the teachers position on the question has been one of self-serving. On the other hand teachers believe that the researchers do not pay attention to the variables in teaching that are important.

A search of the literature revealed that most of the studies show that class size makes no difference in reading achievement. Most of the research was done when pupil population was greater than it is now. More research in this area might now show that this is not true

since we are now having declining enrollments in most school districts. This could lead to new findings that smaller class size will improve reading achievement.

The teachers have always believed that smaller class sizes will give higher achievement scores, but research has not supported this feeling. School administrators tend to agree with the research studies probably due to a financial reason. One teacher teaching fifty children costs less than two teachers, each with a class of twenty-five students.

In the past few months, there have been new findings that indicate smaller class sizes do improve reading achievement. More research needs to be done in this area. If these results prove to be true then policy makers, such as legislators, school board members, and school administrators should be made aware of the findings.

For the purpose of this paper class size is defined as the number of pupils taught by a single teacher. It as been stressed by teachers that class size does make a difference in terms of teaching. The teachers firmly believe that smaller classes means better educational experiences for students.(11:32)

The general trends of class size has changed since the 1920's. The Minnesota studies done by

Hudelson in 1928 indicated that larger classes were superior to smaller classes.(4:41) In 1962 Macomber and Siegal reported small but significant differences in reading achievement that favored small classes. This difference was mainly noted in teacher attitude. Mc Keachie concluded from his review of research on class size that large classes are not inferior to small ones as long as traditional achievement tests are used as the criteria.(1:31)

Class size is often determined by financial considerations in a school district. School administrators have the responsibility of determining school costs for the board of education. The total budget of the district is greatly affected by the number of teachers employed to teach a given number of pupils. Larger classes can help to decrease the trend of rising costs of school personnel and facilities, where as reducing class size would substantially increase these related costs.(8:43)

In a study done by Hickox and Burston(4:42) they found that class size in relationship to academic achievement is largely affected by how it (class) is organized and handled by the teacher. Flower in the Quance Lectures of 1964(4:43) supports this conclusion.

Smith in 1970 (13:36) found that research in

general showed no relationship between class size and pupil's learning, although one must note that the weight on non scientific intuitive feeling on this issue is that small classes are more desirable and that the research instruments employed to evaluate the effects of class size do not incorporate affective-type variables such as teacher and pupil satisfaction. As recent as 1976 Laughlin(7:29) wrote that research data do not substantiate that class sizes make a difference in student cognitive growth.

There is a professor at Arizona State University (12:45) that took a class of 100 children and sucessfully could teach the class. What wasn't brought out was the fact that this large group was broken down into random groups of 8 or 10 children who kept the teacher informed of the learning progress by reports, diaries, behavior experiments and progress in text books. It is reports like this one that researchers base their theory that class size has no relationship to achievement.

The NEA asked teachers in a 1975 nationwide "Teacher Opinion Poll" (10:32) what one change they would make if they could to improve their own morale or professional satisfaction "lower class size" was the most frequent response. A complaint from a teacher

that she loves to teach, but can't do her job because she had 38 third graders in a room designed for 25 or 30.(9:39) Her complaint was that there is no elbow room for the 3 R's much less anything extra. This complaint registered in 1957 is applicable today. But in 1957 there was a shortage of teachers and classrooms. Today we have an over supply.(9:31) Teachers today also feel that they can handle large classes, but it is difficult to do creative work, or give individualized instruction.

Teachers can handle classes of 40 or 50, but the teacher cannot give the attention the children need. The teacher will also miss the child not aggressive enough to demand extra time. Jackson wrote "learning to live in a classroom involves, among other things learning to live in a crowd."(6:34) It is noted here that the child does not have an identity of his own. Children in classes of twenty or more can not relate well on a one to one basis.

Bowen, a third grade teacher in Atlanta Georgia, stated "with todays larger classes teachers cannot be as effective regardless of how good they are or how much experience they have had."(11:32) The problems of class size are also shared by special education teachers. Johnson, an EMR teacher in Georgia, felt that smaller class size will develop a positive self-concept in

special children.(11:33)

Smaller class size can help to motivate students, according to Bolander.(3:12) He found that the size of the class did have a relationship to student motivation. The analysis he found showed that class size substantially explained variations in individual and intragroup motivation level.

Findings

Because teachers prefer small classes and believe that smaller classes increase learning, they are always looking for the proof to back up their belief. This is an important consideration, since that which is perceived to be real is often real in its consequence. One must also remember that teacher morale contributes much to successful educational program.(12:87)

While research studies dealing with educational processes support the policy of reduced class size, such a policy based upon past research using pupil achievement as a criterion does not make a clear case to support that policy. Generally speaking, studies on the effect of class size on pupil achievement are inconsistent because many did not control the many variables that affect pupil learning and achievement and thus have resulted

in inconclusive and conflicting results.

Current research findings now indicate that smaller class size do improve achievement. The Ryan-Greenfield report states that class size research has suffered because it has failed to adequately control the most important variable-the quality of teaching.(5:42)

A recent study by Glass, Cahen, Smith, and Filby have produced some amazing results. They did a literary analysis of 80 studies dating as far back as 1900, involving more than 900,000 pupils.(5:44) The results of the hundreds of comparisons in the 80 studies, showed that 60 percent of them favored small classes. But many of the comparisons were between classes of about 25 pupils and classes of about 35. Taking into account the relationship of the size of the smaller class achievement advantage to the actual numbers of pupils in the smaller and larger classes. In doing this and using the sophisticated methods of data analysis, a complete picture of the relationship between class size and achievement emerged.

This team of researchers collected about half again as many studies as any previous reviewers. They also included studies of the effects of tutoring in very small groups of one, two, or a few pupils.

These researchers show the relationship between achievement and class size, from data integrated across approximately 100 comparisons from studies exercising good experimental control.(5:44)

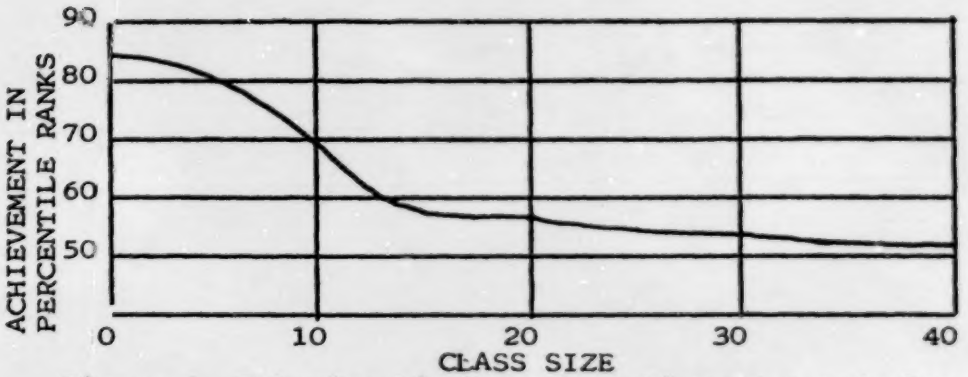

Figure 1 - Relationship between achievement and class size.

The findings mean a typical student in a typical class of 40 scores at the 50th percentile achievement level. The same student taught in a group of 20, would have scored at the 55th percentile, in a group of 15, at the 58th percentile, in a group of 10, at the 65th percentile, and in a group of 5, at the 74th percentile. In other words a student in a group of 40 students would score 24 percentile points higher if taught in a group of 5 students.

TABLE I

RELATIONSHIP BETWEEN SELECTED CLASS SIZE AND ACHIEVEMENT

Class Size	Average Percentitle Ranks In Achievement	Average Growth in one School Year (Grade Equivalent Units)
40	50th	1.00 yr.
30	52nd	1.07 yr.
25	53rd	1.10 yr.
20	55th	1.15 yr.
15	58th	1.24 yr.
10	65th	1.45 yr.
5	74th	1.72 yr.

Using Table I, lets assume a fifth grade student in a class of 40 might be expected, on the average, to gain 10 grade-equivalent months in a school year on a given standardized achievement test. The average student in a class of 10 would be expected to gain 14.5 months, and the average student in a class of 5 would be expected to gain more than 17 grade-equivalent months.

After the comparisons in percentile ranks and grade-quivalents were made, the data were sorted into various subcategories, such as subject matter tested, and pupil grade level. The conclusions showed that the

relationship between class size and achievement were slightly stronger in secondary schools than in elementary schools. There was little difference in reading, mathematics and language scores.

These studies indicate that for every student which the class size is reduced below 20, the class's average achievement improves substantially more than for each student in which class size is reduced between 30 and 20. Even though class size reduction improves student achievement, it is not necessarily true in every case. There has been instances of students in large classes outperforming students in small classes. Of course, these findings are the exception. It indicates that researchers should consider classroom curriculum and teaching procedures. For example, some of the variables are:(14:28)

1. Instructional procedures used.
2. Beliefs and capabilities of the teacher.
3. Demonstrated abilities and backgrounds of the students.
4. Subject matter
5. Nature of learning objectives.
6. Availability of materials and facilities.

Class size and student achievement are also related to the age of the pupils, as well as their academic ability. Young children and lower ability students achieve significantly better in basic skills

(reading and arithmetic) when they are in small classes. Smaller classes are particularly effective for children of lower socioeconomic status(S.E.S.). The South Carolina Department of Education(15:46) found similar results when it studied the achievement of lower S.E.S. first-graders in reading and arithmetic.

There is also some evidence of a positive relationship between small class size and the achievement of primary grade children.(15:47) The methods and quality of instruction are just as important as class size. When class size was reduced certain teaching procedures and practices perceived by some educators as conductive to learning occurred frequently. Some of these procedures were:(14:27)

1. Individualization
2. Creativity
3. Group activity
4. Interpersonal regard

Current research also indicated that the benifits from reduced class size would not be evident if the same instructional methods and procedures used in the larger classes were carried over to the smaller classes. The teachers do not always take advantage of the smaller class size to do more individualized instruction.

The teachers have always believed in smaller class sizes will improve achievement. Teachers view large

classes as a major factor negatively influencing:(4:41)

1. Teacher moral.
2. Job satisfaction.
3. Academic performance of students
4. Personal development of students
5. Social development of students.

The greatest rewards that come from smaller classes seem to come from those hard-to-measure areas of personality and character development. The teachers with smaller classes can emphasize human values, foster self-acceptance by the child, nourish his creative traits, and aid his social development. The teacher of smaller classes can attempt many innovations that may make teaching more effective. Research has shown that teachers try innovations in small classes, only to drop them if the classes become large.(10:32)

Conclusion

Results of national opinion polls conducted among elementary school teachers indicate that about half of the teachers polled believed they could do their most effective teaching with a class containing 20-24 children.(14:28) The public perceives small classes as being of major importance to student achievement and progress.(5:42)

Class size is a major determinant of school

system budgets. A major factor is that increasing class size just to save money can cause pupils to learn less. On the other hand, achievement appears to increase only when class size drops below 20. Giving all teachers classes of 15 for the full school day would be very expensive. There are alternatives that school districts should consider:(5:43)

1. Employing reading specialists.
2. Additional teachers for the periods when reading and math are taught.
3. Use of paraprofessionals.
4. Scheduling and grouping within the classroom.
5. Team teaching.

Schools might also learn to use small-class instruction. Small classes have often been used for remedial instruction programs. Small classes may also be most justifiable in the primary grades to give more individualized instruction.

The final weighing of class size versus achievement becomes a question of values. Class size may be related to such factors as teacher satisfaction, opportunity for individualized instruction and peer teaching, enriching the curriculum, and a lower rate of student failure.

If reducing class size promises to increase learning by enabling the schools to improve or intensify the instructional program, then it should be a major consideration. Teachers have generally believed with

deep conviction that smaller classes are better for learning. Since some researchers have found that smaller classes must bring with them changes in instructional methods and teacher behavior before improved learning can take place, more longitudinal studies are needed to measure the effects of such possible changes over a period of time.

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